

## Quantification of *Juniperus ashei* pollen production for the development of forecasting models

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*Juniperus ashei* pollen is considered one of the most allergenic species of Cupressaceae in North America. *Juniperus ashei* is distributed throughout central Texas, Northern Mexico, the Arbuckle Mountains of south central Oklahoma, and the Ozark Mountains of northern Arkansas and southwestern Missouri. The large amount of airborne pollen that *J. ashei* produces affects inhabitants of cities and towns adjacent to juniper woodland areas and because juniper pollen can be transported over long distances, it affects populations that are far away. In order to create a dynamic forecast system for allergy and asthma sufferers, pollen production must be estimated. Estimation of pollen production requires the estimation of male cone production. Two locations in the Arbuckle Mountains of Oklahoma and 4 locations in the Edwards Plateau region of Texas were chosen as sampling sites. Trees were measured to determine approximate size. Male to female ratio was determined and pollen cone production was estimated using a qualitative scale from 0 to 2. Cones were counted from harvested 1/8 sections of representative trees. The representative trees were measured and approximate surface area of the tree was calculated. Using the representative tree data, the number of cones per square meter was calculated for medium production (1) and high production (2) trees. These numbers were extrapolated to calculate cone production in other trees sampled. Calibration was achieved within each location's sub-plot by counting cones on 5 branches collected from 5 sides of both high production and medium production trees. The total area sampled in each location was 0.06 hectare and total cone production varied greatly from location to location. The highest production area produced 5.8 million cones while the lowest production area produced 72,000 cones. A single representative high production tree in the Arbuckle Mountains produced 1.38 million cones. The number of trees per location was relatively uniform, but the number of high cone production trees varied greatly. Although there is great diversity in the locations making it difficult to determine which factors are most important, cone production was well correlated with certain stand characteristics including trunk diameter.